Code No: R203103I **R20** SET - 1

III B. Tech I Semester Supplementary Examinations, July -2023
NANO TECHNOLOGY
(Common to CE, ME, ECE, CSE)

Time: 3 hours Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
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UNIT-I

1. a) Distinguish nanomaterials and give examples for them. [7M]
   b) Why "surface area/volume" ratio is very large for nanoparticles compared to bulk materials? Justify. [7M]

(**OR**)

2. a) List out challenges faced by Nanotechnology. Explain anyone. [7M]
   b) How has nanotechnology developed over a time? Discuss. [7M]

UNIT-II

3. a) What is the phenomena of 'Giant Magnetic Resonance' in Nano materials? Discuss briefly. [7M]
   b) How does melting point and diffusivity effect by Nano dimensionality. [7M]

(**OR**)

4. a) Summarize the optical properties of Nano particles. [7M]
   b) Make a generic comparison of mechanical properties of carbon nanotubes with those of steel. Discuss briefly. [7M]

UNIT-III

5. a) Outline the processing steps for preparation of nanostructures using electron beam lithography. [7M]
   b) Draw a neat sketch representing the complete lithography process. [7M]

(**OR**)

6. a) Differentiate Hot iso-static pressing and Cold iso-static pressing. [7M]
   b) Write a short note on Spark plasma sintering. [7M]

UNIT-IV

7. Describe the construction and working mechanism of Transmission Electron Microscope (TEM) with a suitable diagram. [14M]

(**OR**)

8. a) Explain the instrumentation setup and working principle of Scanning Tunneling Microscope (STM) [7M]
   b) Write a note on Nano indentation. [7M]

UNIT-V

9. a) Distinguish MEMS and NEMS. [7M]
   b) List out the major concerns and challenges of nanotechnology. [7M]

(**OR**)

10. a) Outline the application of nanotechnology in defense and space. [7M]
    b) How is nanotechnology used in water treatment? Discuss. [7M]